



Rewarding Learning

**General Certificate of Secondary Education
2011–2012**

Science: Double Award (Modular)

Forces and Energy
End of Module Test
Foundation Tier

C

[GDC01]

THURSDAY 24 MAY 2012

9.15 am–10.00 am

**MARK
SCHEME**

			AVAILABLE MARKS
1	(a) Heat or Thermal	[1]	5
	(b) Chemical [1] Electrical [1]	[2]	
	(c) Sound [1] Light [1]	[2]	
2	(a) (i) Coal or oil or nuclear	[1]	4
	(ii) Limited supply or used quicker than replaced or will run out	[1]	
	(b) (i) Solar or Wind	[1]	
	(ii) Limitless or will never run out or equivalent	[1]	
3	Av. Speed = $\frac{\text{distance}}{\text{time}}$ [1]		3
	= $\frac{5040}{1200}$ [1]		
	= 4.2 (m/s) [1]	[3]	
4	(i) Trap air [1] so is a (good) insulator [1]	[2]	4
	(ii) Urea formaldehyde in cavity or Cavity Wall Insulation Double glazing Carpets, Draught proofing Any two [1] each	[2]	
5	(a) (i) Vertically upwards at X [1] Vertically down at Y [1]	[2]	4
	(ii) Convection	[1]	
	(b) Radiation	[1]	
6	(a) (i) "is equal to" – middle box <input checked="" type="checkbox"/>	[1]	3
	(ii) Friction or Air Resistance or Drag	[1]	
	(b) Increases or accelerates	[1]	

			AVAILABLE MARKS
7	(a) Arrow tangentially upwards	[1]	
	(b) Momentum = Mass \times Velocity or $p = mv$ [1] $= 0.6 \times 3.0$ [1] $= 1.8$ (kg m/s) [1]	[3]	4
8	(a) $2\text{ N} \equiv 6\text{ cm}$ [1] $1\text{ N} \equiv 3\text{ cm}$ [1] $5\text{ N} \equiv 15\text{ cm}$ [1]	[3]	
	(b) Permanently deformed or Plastically deformed or It will not return to its original dimensions	[1]	4
9	Pressure = $\frac{\text{Force}}{\text{Area}}$ or $P = F/A$ [1] $= \frac{650}{0.02}$ [1] $= 32500$ [1] Pa or N/m^2 [1]	[4]	5
10	(a) 5 or 6 points correct [1] Straight line through (0,0) [1]	[2]	
	(b) e.g. Grad. = Velocity [1] $= \frac{300}{10}$ or any suitable pair of coordinates [1] $= 30$ (m/s) [1]	[3]	5
11	(a) Efficiency = $\frac{\text{Useful output energy}}{\text{Input energy}}$ [1] $= \frac{240}{1500}$ [1] $= 0.16$ or 16% [1]	[3]	
	(b) 1260 (J)	[1]	4
12	(a) $WD = F \times d$ [1] $= 120 \times 1.5$ [1] $= 180$ (J) [1]	[3]	
	(b) Power = $\frac{WD}{t}$ [1] $= \frac{180}{15}$ [1] allow e.c.f. from (a) $= 12$ (W) [1]	[3]	6
Total			50